

CLAIMS

1- A laser active optronic system comprising a channel (1) for the
5 emission by an emission source (10) of a laser beam illuminating a target
and a channel (2) for receiving the wave backscattered by the target,
characterized in that an optical switching device (24) is positioned in the
receive channel, said optical switching device receiving said backscattered
wave and comprising an optical gain medium (241) and pumping means
10 (242) for pumping said gain medium, said gain medium being absorbent at
the wavelength of the laser and becoming substantially transparent when it is
pumped, in such a way as to allow the switching device to be actuated in the
on mode or off mode respectively, and characterized in that it further includes
a control unit (243) for controlling the pumping means, allowing the switching
15 device to be actuated in the on mode in at least one temporal window of
predetermined duration, triggered at a predetermined instant after the start of
emission of the illuminating laser beam.

2- The optronic system as claimed in claim 1, in which the gain
medium (241), when it is pumped, furthermore generates a backscattered
20 wave amplification effect.

3- The optronic system as claimed in either of the preceding
claims, in which the pumping means are optical pumping means comprising
a source (242) for emitting a pump beam intended for pumping the gain
medium.

25 4- The optronic system as claimed in claim 3, in which the source
for emitting the pump beam means is extracted from the source (10) for
emitting the target-illuminating beam.

5- The optronic system as claimed in one of the preceding claims,
in which the optical switching device is positioned near an intermediate focal
30 plane.

6- An active imaging optronic system as claimed in claim 5, in
which the gain medium is formed from a uniform block and in that the
pumping means are optical pumping means comprising a source for emitting
a pump beam and a spatial light modulator to which said pump beam is sent,
35 making it possible for the various regions of the gain medium, which are

distributed over the entire block in a two-dimensional matrix, to be selectively actuated.

7- The active imaging optronic system as claimed in claim 5, in which the gain medium is arranged in the form of a matrix of optical-gain elements, it being possible for said elements to be pumped selectively by
5 said pumping means.

8- The optronic system as claimed in one of the preceding claims, in which the gain medium is a semiconductor material pumped by optical pumping means.

10 9- The optronic system as claimed in one of claims 1, 2, 5 and 7, in which the gain medium is a semiconductor material pumped by electrical pumping means.

10- The optronic system as claimed in either of claims 8 and 9, in which said semiconductor material is of the GaInAsP type, the composition of
15 which is adapted according to the wavelength of the emission laser beam.

11- The optronic system as claimed in one of claims 1 to 6, in which the gain medium is a material having three transition levels.

12- The optronic system as claimed in claim 11, in which the gain medium contains erbium ions, the pumping means being optical pumping
20 means operating at 0.98 or 1.48 microns.

13- The optronic system as claimed in one of the preceding claims, in which the control unit is programmed to actuate the switching device in on mode according to several temporal windows corresponding to different distance doors for analyzing a scene in three dimensions.